of ore and lime are next; charged and heated up, and whilst they melt, the necessary repairs at the slag line, which should be much less than with fixed furnaces, are taken in hand. As soon as the additions are melted down, the first ladlefal of pig iron is run in. Hereon again additions are charged, and on these is poured the second ladleful, which always exercises a much smaller reaction. Special value is laid on obtaining as complete reaction as possible, after teeming in the pig iron. After this, the bath contains only about 0*3 per cent. C. The larger the amount of pig iron poured in at a time, and the higher the silicon content of the same, the livelier reaction takes place. If the bath has quietened down to some extent, after the second addition of pig iron, a portion of the sing is removed, since too thick a slag covering hinders the finishing. The ferro-manganese is added in the casting ladle. In spite of decarburisation appearing from the description to take place so rapidly, a charge of 50 tons is only tapped off every six hours, which is thus equal to a production of 200 tons per diem. The first furnace produced in the first twelve working weeks somewhat less, namely a round 1,000 tons per week, or 120 kilogrammes steel per minute. The coal consumption amounted to approximately 25 per cent., the output (taken 013. the weight of the metal charged) to 105"? per cent.

The condition that tilting furnaces are required, the building of which is very costly, is mainly the cause of the process having found relatively small adoption. A. Surzycki i sought to make it adaptable to fixed furnaces, by means of i providing several tap-holes at different heights.

(2.) THE COMBINED PROCESSES.

Two other processes, which enable the open-hearth furnace to work pig, iron without scrap, are the combined processes, namely the Witkowitz duplex process and the process of Pszczolka-Daelen. Both are based on the idea of removing the greatest portion of the reducing agents from the pig iron before it is introduced into the open-hearth furnace. As a suitable pig iron for this process, Witkowitz employs one